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EXAMINER	
FERNANDEZ RIVAS, OMAR F	

ART UNIT	PAPER NUMBER
2129	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/806,090	HOYA, TETSUYA	
	Examiner	**Art Unit**	
	OMAR F. FERNANDEZ RIVAS	2129	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15 and 18-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15 and 18-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to an RCE filed by the Applicant on March 24, 2008.

2. The Office Actions of July 31, 2007, February 6, 2007 and May 15, 2006 are incorporated into this Non-Final Office Action by reference.

Status of Claims

3. Claims 1, 8, 13 and 20 have been amended. Claims 16 and 17 have been previously cancelled. Claims 1-15 and 18-21 are pending on this application.

Information Disclosure Statement

4. The information disclosure statement has not been filed for this application. To comply with 37 CFR 1.98(a)(1), the following is required: (1) a list of all patents, publications, applications, or other information submitted for consideration by the Office; (2) U.S. patents and U.S. patent application publications listed in a section separately from citations of other documents; (3) the application number of the application in which the information disclosure statement is being submitted on each page of the list; (4) a column that provides a blank space next to each document to be considered, for the examiner's initials; and (5) a heading that clearly indicates that the list is an information disclosure statement.

Claim Rejections - 35 USC § 101

Claims 1-21 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The computer system must set forth a practical application of judicial exception to produce a real-world result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-77. The invention is ineligible because it has not been limited to a substantial practical application.

For a claimed invention to be statutory the claimed invention must produce a useful, concrete, and tangible result. As the Supreme Court has made clear, " [a]n idea of itself is not patentable," *Rubber-Tip Pencil Co. v. Howard,* 20 U.S. (1 Wall.) 498, 507 (1874); taking several abstract ideas and manipulating them together adds nothing to the basic equation. In re Warmerdam, 31 USPQ2d 1754 (Fed. Cir. 1994).

For a claimed invention to be statutory under 35 U.S.C. 101, the claims must provide a tangible result, and there must be a practical application, by either: 1) transforming (physical thing) or 2) by having the FINAL RESULT (not the steps) achieve or produce a useful (specific, substantial, AND credible), concrete (substantially repeatable/non-unpredictable), AND tangible (real world/non-abstract) result.

A claim that recites a computer that solely calculates a mathematical formula is not statutory.

In the present case, claim 1 describes a neural network system. The claim does not provide a useful result because the claimed subject matter fails to sufficiently reflect at least one practical utility set forth in the descriptive portion of the specification. A neural network, in and of itself, is useless in a real world situation absent a particular

substantial application. The claims are not limited to a substantial practical application because they encompass a neural network without any description as to what it does or what is the output obtained from the network. Simply stated, there is no specific purpose or use for the neural network system claimed. Claims that recite a computer that solely calculates a mathematical formula are not statutory

The claim also fails to provide a tangible result because the claimed subject matter fails to produce a result that is limited to having real world value rather than a result that may be interpreted to be abstract in nature as, for example, a thought, a computation, or manipulated data. More specifically, the claimed subject matter provides for a neural network system. The claim does not provide a result from the system that has a real world value.

Claims 2-7 depend from claim 1 and incorporate the same deficiencies, and furthermore fail to rectify the aforementioned deficiencies.

Claims 8-12, 13-15 and 18, 19 and 20-21 recite limitations similar to that of claims 1-8 and are rejected on the same basis.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-15 and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kevin Gurney in view of Hatayama ("An Introduction to Neural Networks", referred to as **Gurney**; US Patent #6,219,657; referred to as **Hatayama**).

Claim 1

Gurney anticipates an interconnecting neural network system (**Gurney**: page 1, L16-24) comprising: a neural network unit that includes a plurality of neurons (**Gurney**: page 1, L16-24; page 2, L19 to page 3, L9; Figs 1.2 or 1.3), each of the neurons outputting an excitation strength according to a similarity between input vectors and centroid vectors based on a kernel function (**Gurney**: page 1, L16-24; page 2, L19 to page 3, L9; page 14, L1-27; page 182, L15 to page 185, L21; Figs 1.2, 1.3, 2.4; Examiner's Note (EN): the activation (excitation strength) is calculated by the difference ||x-w|| (similarity). Radial Basis Function is a kernel function. Moreover, any function used by the neuron to provide its activation is a kernel function); and network control unit that constructs an artificial neural network structure by interconnecting neurons relating to each other among the neurons in the neural network unit via a weight (**Gurney**: page 1, L16-24; page 2, L19 to page 3, L9; Figs 1.2 or 1.3; EN: learning will develop a final structure for the neural network. The weights will relate the nodes in the final structure. Note that no restriction has been placed on the claim as to what "relating to each other" entails), wherein each of the neurons in the neural network unit outputs an excitation strength according to the similarity between the input vectors and the centroid vectors based on the kernel function when each neuron is excited by the input

vector applied from an outside (**Gurney**: page 1, L16-24; page 2, L19 to page 3, L9; page 14, L1-27; page 182, L15 to page 185, L21; Figs 1.2, 1.3, 2.4; EN: depending on the input vector, activation (excitation) will be calculated. The input vector must be provided from somewhere), and outputs a pseudo excitation strength obtained based on an excitation strength output from the other neuron when each neuron is excited in a chain reaction to excitation of the other neuron connected to each neuron (**Gurney**: page 1, L16-24; page 2, L19 to page 3, L9; page 14, L1-27; page 182, L15 to page 185, L21; Figs 1.2, 1.3, 2.4; EN: the activation (excitation strength) of each neuron will be the input to a neuron in a successive layer (chain reaction). The activation calculated by the neurons or the RBF units are considered pseudo excitation strength as understood from paragraph 60 of the specification of the instant application), wherein each of the neurons in the neural network unit has a plurality of modalities different from one another (**Gurney**: pages 44-46, sections 4.4 to 4.5.2; page 182, L15 to page 185, L21; EN: the association units will provide each neuron the functionality of operating on different input data by dividing the input pattern into a grid and providing an output based on the input pattern, therefore providing different "modalities" for the neurons. Moreover, if the neuron can classify two classes, then it has a plurality of modalities, since it can provide a response for different input data. Moreover, each RBF will have a different centre (different basis function or "modality") and provide a contribution to the output).

Gurney does not teach the plurality of modalities of the neurons including auditory modality and visual modality so that a plurality of different input vectors of

auditory modality and visual modality **can be** handled (as opposed to actually being handled) simultaneously and independently by the neurons.

Hatayama teaches the plurality of modalities of the neurons including auditory modality and visual modality so that a plurality of different input vectors of auditory modality and visual modality **can be** handled simultaneously and independently by the neurons (**Hatayama**: C3, L31 to C4, L53; C6, L 43-47; Figs. 1, 2, or 13; EN: the neural network receives camera information (visual modality) and voice information (auditory information) as well as other data from the user and apparatus information (different modalities). The pieces of the information input to the neural network are vectors of different "modalities" or type of data. Therefore, a plurality of different input vectors are received by the neural network and handled simultaneously. A person of ordinary skill in the arts would also recognize that neural networks operate on data inputted in vector form and that each neuron will process the inputs received independently. Also note that the recitation that a function **can be** performed (as opposed to actually performing; this is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense).

It would have been obvious to one of ordinary skill in the arts at the time of the applicant's invention to modify the teachings of Gurney by incorporating the plurality of modalities of the neurons including auditory modality and visual modality so that a plurality of different input vectors of auditory modality and visual modality **can be** handled simultaneously and independently by the neurons as taught by Hatayama for

the purpose of having a multifunction system capable of operating on different types of data (**Hatayama**: C1, L14-17).

Claim 2

Gurney anticipates each neuron in the neural network unit outputs the pseudo excitation strength and also outputs the centroid vector of each neuron when each neuron is excited in a chain reaction to the excitation of the other neuron connected to each neuron (**Gurney**: page 182, L15 to page 185, L21; EN: calculating the activation is calculating the activation is calculating the excitation strength. The centroid vector is the weight vector and it will be provided (outputted) to the next node connected (weighted connections) to the node).

Claims 3 and 9

Gurney anticipates the network control unit interconnects the neurons relating to each other among the neurons in the neural network unit, based on an order of the neurons added or excited at time series in association with a plurality of input vectors applied to the neural network unit from the outside (**Gurney**: page 1, L16-24; page 2, L19 to page 3, L9; page 14, L1-27; Figs 1.2 and 1.3; EN: learning will develop a final structure for the neural network. During training, the neurons will be added (connected) or excited on a layer-by-layer basis. Since each neuron will have to wait to receive data from a neuron in a preceding layer, the interconnections will be made in time series).

Claims 4 and 15

Gurney anticipates the network control unit trains the weight that connects the neurons to each other, based on the excitation strength of each neuron in the neural

network unit (**Gurney**: page 1, L16-24; page 2, L19 to page 3, L9; page 4, L10-31; page 14, L1-27; pages 39-44, sections 4.1-4.4; EN: learning is training. Each neuron will provide an output as input to the nodes to which it is connected).

Claims 5 and 10

The network control unit removes each neuron at a predetermined timing determined based on the excitation strength of each neuron in the neural network unit (**Gurney**: page 1, L16-24; page 2, L19 to page 3, L9; page 4, L10-31; page 14, L1-27; pages 39-44,sections 4.1-4.4; EN: the weights will determine the strength of the connections, therefore connecting or disconnecting (removing) neurons during training).

Claim 6

Gurney anticipates each neuron in the neural network unit is an intermediate layer neuron using, as the centroid vector, centroid data in a matrix form in light of time series changes, and each intermediate layer neuron is connected to an output layer neuron that outputs a change in the excitation strength output from each intermediate layer neuron at time series (**Gurney**: page 182, L15 to page 185, L21; Fig10.15; EN: a vector is considered a one row matrix. Training will update the weight vector (time series changes)).

Claims 7, 11, 18 and 21

Gurney teaches the kernel function employed in each neuron in the neural network unit includes a radial basis function (**Gurney**: page 182, L15 to page 185).

Claim 8

Gurney anticipates a method of constructing an interconnecting neural network structure (**Gurney**: page 1, L16-24), the method comprising the steps of: preparing an artificial neural network structure including a plurality of neurons (**Gurney**: page 1, L16-24; page 2, L19 to page 3, L9; Figs 1.2 and 1.3), each of the neurons outputting an excitation strength according to a similarity between an input vector and a centroid vector based on a kernel function (**Gurney**: page 1, L16-24; page 2, L19 to page 3, L9; page 14, L1-27; page 182, L15 to page 185, L21; Figs 1.2, 1.3, 2.4; Examiner's Note (EN): the activation (excitation strength) is calculated by the difference ||x-w|| (similarity). Radial Basis Function is a kernel function. Moreover, any function used by the neuron to provide its activation is a kernel function), the neurons relating to each other interconnected in the artificial neural network structure via a weight (**Gurney**: page 1, L16-24; page 2, L19 to page 3, L9; Figs 1.2 and 1.3; EN: learning will develop a final structure for the neural network. The weights will relate the nodes in the final structure); and training the weight that connects the neurons to each other, based on the excitation strength of each neuron (**Gurney**: page 1, L16-24; page 2, L19 to page 3, L9; page 4, L10-31; page 14, L1-27; pages 39-44, sections 4.1-4.4; learning is training. Each neuron will provide an output as input to the nodes to which it is connected), wherein each of the neurons in the artificial neural network structure has a plurality of modalities different from one another **Gurney**: pages 44-46, sections 4.4 to 4.5.2; page 182, L15 to page 185, L21; EN: the association units will provide each neuron the functionality of operating on different input data by dividing the input pattern into a grid and providing an

output based on the input pattern, therefore providing different "modalities" for the neurons. Moreover, if the neuron can classify two classes, then it has a plurality of modalities, since it can provide a response for different input data. Moreover, each RBF will have a different centre (different basis function or "modality") and provide a contribution to the output).

Gurney does not teach the plurality of modalities of the neurons including auditory modality and visual modality so that a plurality of different input vectors of auditory modality and visual modality can be handled simultaneously and independently by the neurons.

Hatayama teaches the plurality of modalities of the neurons including auditory modality and visual modality so that a plurality of different input vectors of auditory modality and visual modality **can be** handled simultaneously and independently by the neurons (**Hatayama**: C3, L31 to C4, L53; C6, L 43-47; Figs. 1, 2, and 13; EN: the neural network receives camera information (visual modality) and voice information (auditory information) as well as other data from the user and apparatus information (different modalities). The pieces of the information input to the neural network are vectors of different "modalities" or type of data. Therefore, a plurality of different input vectors are received by the neural network and handled simultaneously. A person of ordinary skill in the arts would also recognize that neural networks operate on data inputted in vector form and that each neuron will process the inputs received independently. Also note that the recitation that a function **can be** (as opposed to actually doing) performed is not

a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense).

It would have been obvious to one of ordinary skill in the arts at the time of the applicant's invention to modify the teachings of Gurney by incorporating the plurality of modalities of the neurons including auditory modality and visual modality so that a plurality of different input vectors of auditory modality and visual modality **can be** handled simultaneously and independently by the neurons as taught by Hatayama for the purpose of having a multifunction system capable of operating on different types of data (**Hatayama**: C1, L14-17).

Claims 12 and 19

Gurney anticipates a computer readable recording medium storing an interconnecting neural network structure construction program that allows a computer to execute the method according to claim 8 (**Gurney**: page 1, L16-24; EN: Neural networks are computer systems. Computers must have programs stored in some medium in order to perform its operations).

Claim 13

Gurney anticipates a method of constructing a self-organizing neural network structure including a plurality of neurons (**Gurney**: page 115 to page 118, section 8.2; page 185, L12-21), each of the neurons outputting an excitation strength according to a similarity between an input vector and a centroid vector based on a kernel function (**Gurney**: page 182, L15 to page 185, L21; Fig. 2.4; Examiner's Note (EN): the activation (excitation strength) is calculated by the difference ||x-w|| (similarity). Radial

Basis Function is a kernel function), the neurons relating to each other being autonomously connected in the self-organizing neural network structure based on the input vector (**Gurney**: page 115 to page 122, section 8.2.1), the method comprising: a first step of adding a neuron, which has an input vector as a centroid vector for a kernel function, into the self-organizing neural network structure as a new neuron based on an input vector that is input first from an outside (**Gurney**: page 115 to page 122, section 8.2.1; page 182, L15 to page 185, L21; EN: during training, lateral connections will be made based on the input vector); and a second step of repeating following processings (a) to (c), each of the processings being based on an input vector that is an n^{th} input vector from the outside, where n is an integer equal to or greater than 2: (a) the processing of calculating excitation strengths of all the neurons in the self-organizing neural network structure based on the n^{th} input vector input from the outside; (b) the processing of adding a neuron, which has the n^{th} input vector as a centroid vector for a kernel function, into the self-organizing neural network structure as a new neuron in case that it is determined by the processing (a) that there is no neuron excited such that the excitation strength thereof exceeds a predetermined threshold, among one or a plurality of neurons in the self-organizing neural network structure; and (c) the processing of performing both of or one of formation of a weight that connects the neurons, and training of the formed weight based on the excitation strengths of the neurons in the self-organizing neural network structure (**Gurney**: page 115 to page 120, L25; page 185, L12-21); wherein each of the neurons in the self-organizing neural network structure has a plurality of modalities different from one another (**Gurney**:

pages 44-46, sections 4.4 to 4.5.2; page 182, L15 to page 185, L21; EN: the association units will provide each neuron the functionality of operating on different input data by dividing the input pattern into a grid and providing an output based on the input pattern, therefore providing different "modalities" for the neurons. Moreover, if the neuron can classify two classes, then it has a plurality of modalities, since it can provide a response for different input data. Moreover, each RBF will have a different centre (different basis function or "modality") and provide a contribution to the output).

Gurney does not teach the plurality of modalities of the neurons including auditory modality and visual modality so that a plurality of different input vectors of auditory modality and visual modality can be handled simultaneously and independently by the neurons.

Hatayama teaches the plurality of modalities of the neurons including auditory modality and visual modality so that a plurality of different input vectors of auditory modality and visual modality **can be** handled simultaneously and independently by the neurons (**Hatayama**: C3, L31 to C4, L53; C6, L 43-47; Figs. 1, 2, and 13; EN: the neural network receives camera information (visual modality) and voice information (auditory information) as well as other data from the user and apparatus information (different modalities). The pieces of the information input to the neural network are vectors of different "modalities" or type of data. Therefore, a plurality of different input vectors are received by the neural network and handled simultaneously. A person of ordinary skill in the arts would also recognize that neural networks operate on data inputted in vector form and that each neuron will process the inputs received independently. Also note

that the recitation that a function **can be** (as opposed to actually doing) performed is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense).

It would have been obvious to one of ordinary skill in the arts at the time of the applicant's invention to modify the teachings of Gurney by incorporating the plurality of modalities of the neurons including auditory modality and visual modality so that a plurality of different input vectors of auditory modality and visual modality **can be** handled simultaneously and independently by the neurons as taught by Hatayama for the purpose of having a multifunction system capable of operating on different types of data (**Hatayama**: C1, L14-17).

Claim 14

Gurney anticipates in the second step, a processing (d) of removing a neuron determined to be unnecessary based on the excitation strengths of the neurons in the self-organizing neural network structure is further performed (**Gurney**: page 116 to page118, section 8.1; page 127 to page 129, section 8.3.3; EN: inhibitory connections will remove neurons. Moreover, if a neuron is "off" it has been removed).

Claim 15

Gurney anticipates each of the neurons in the self-organizing neural network structure holds a class label relating to a final output, and, in the processing (c) in the second step, only in case that the class label held by each neuron in the self-organizing neural network structure is identical, both of or one of the formation of the weight that

connects the neurons, and the training of the formed weight is performed based on the excitation strengths of the neurons (**Gurney**: pages 135-136, section 8.3.6).

Claim 20

Gurney anticipates an interconnecting neural network system comprising: a plurality of intermediate layer neurons (**Gurney**: page 71, section 6.6, L1-4; page 72, Figs. 6.4 and 6.5; page 184, L13-16; Fig 10.15), each of the intermediate layer neurons outputting an excitation strength according to a similarity between an input vector and a centroid vector based on a kernel function (**Gurney**: page 1, L16-24; page 2, L19 to page 3, L9; page 14, L1-27; page 182, L15 to page 185, L21; Figs 1.2, 1.3, 2.4; Examiner's Note (EN): the activation (excitation strength) is calculated by the difference ||x-w|| (similarity). Radial Basis Function is a kernel function) and each of the intermediate layer neurons using centroid data in a matrix form in light of time series changes as the centroid vector (**Gurney**: page 182, L15 to page 185; Fig. 10.15; EN: a vector is considered a one row matrix. Training will update the weight vector (time series changes)); an output layer neuron connected to each of the intermediate layer neurons and outputting a change in the excitation strength output from each intermediate layer neuron at time series (**Gurney**: page 1, L16-24; page 2, L19 to page 3, L9; page 14, L1-27; page 182, L15 to page 185, L21); wherein each of the neurons in the self-organizing neural network structure has a plurality of modalities different from one another (**Gurney**: pages 44-46, sections 4.4 to 4.5.2; page 182, L15 to page 185, L21; EN: the association units will provide each neuron the functionality of operating on different input data by dividing the input pattern into a grid and providing an output

based on the input pattern, therefore providing different "modalities" for the neurons. Moreover, if the neuron can classify two classes, then it has a plurality of modalities, since it can provide a response for different input data. Moreover, each RBF will have a different centre (different basis function or "modality") and provide a contribution to the output).

Gurney does not teach the plurality of modalities of the neurons including auditory modality and visual modality so that a plurality of different input vectors of auditory modality and visual modality **can be** handled simultaneously and independently by the neurons.

Hatayama teaches the plurality of modalities of the neurons including auditory modality and visual modality so that a plurality of different input vectors of auditory modality and visual modality **can be** handled simultaneously and independently by the neurons (**Hatayama**: C3, L31 to C4, L53; C6, L 43-47; Figs. 1, 2, and 13; EN: the neural network receives camera information (visual modality) and voice information (auditory information) as well as other data from the user and apparatus information (different modalities). The pieces of the information input to the neural network are vectors of different "modalities" or type of data. Therefore, a plurality of different input vectors are received by the neural network and handled simultaneously. A person of ordinary skill in the arts would also recognize that neural networks operate on data inputted in vector form and that each neuron will process the inputs received independently. Also note that the recitation that a function **can be** (as opposed to actually doing) performed is not

a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense).

It would have been obvious to one of ordinary skill in the arts at the time of the applicant's invention to modify the teachings of Gurney by incorporating the plurality of modalities of the neurons including auditory modality and visual modality so that a plurality of different input vectors of auditory modality and visual modality **can be** handled simultaneously and independently by the neurons as taught by Hatayama for the purpose of having a multifunction system capable of operating on different types of data (**Hatayama**: C1, L14-17).

Response to Applicant's arguments

7. The Applicant's arguments have been fully considered but are not persuasive.

8. In reference to Applicant's arguments:

Applicant respectfully submits that, in the present invention, the neurons in the neural network unit have a plurality of modalities different from each other. The plurality of modalities of the neurons including auditory modality and visual modality so that a plurality of different input vectors of auditory modality and visual modality can be handled simultaneously and independently by the neurons. Therefore, the neurons can handle a plurality of different input vectors each having a particular, different length, such as auditory data and visual data. In other words, according to the present invention, a plurality of different data such as the five senses of a human being (e.g., auditory sense, visual sense of a human being, etc.) can be inputted together to this neural network at the same time and processed by interconnecting the neurons in this system.

Examiner's response:

Item 14 applies. The claims make no mention of the length of the input vectors. Also note that any neuron in a neural network can only process data one at a time.

That is, a computer system, such as a neural network, can only process one instruction at any given time. As stated in the arguments above, the only way that data from different sources can be processed at the same time is by inputting them together. Therefore, as taught by Hatayama, receiving pieces of information (vectors) from different sources by the neural network will process these vectors of different "modalities" simultaneously (**Hatayama**: C3, L31 to C4, L53; C6, L 43-47; Figs. 1, 2, and 13).

9. In reference to Applicant's arguments:

In particular, although Hatayama discloses that the user's information is collected by sensors such as a camera 1 or a microphone 2, such information is not directly input to the behavior determination block 53. More specifically, Hatayama in FIG. 5 discloses that the user's information is first processed by the input detection information processing block 51 (see col. 5, lines 15-22), and the processed information is subsequently sent to the behavior determination block 53 <u>as a single vector, not a plurality of vectors</u> as recited in claims 1, 8, 13 and 20. As shown in FIG. 8 of Hatayama, in the behavior determination block 53, the user's information is first processed to form a single vector (S201), and the processed information is subsequently sent to the neural network emotion state input step (S202)(see col. 5, lines 43-48).

In addition, Hatayama nowhere discloses that the neurons in the neutral network unit have a plurality of modalities different from one another or that the plurality of modalities of the neurons including auditory modality and visual modality as recited in claims 1, 8, 13 and 20.

Hatayama also fails to teach "the plurality of modalities of the neurons including auditory modality and visual modality so that a plurality of different input vectors of auditory modality and visual modality can be handled simultaneously and independently by the neurons" as recited in amended claims 1, 8, 13 and 20.

Examiner's response:

Item 14 applies. As stated above, the neural network of Hatayama receives inputs from different sources, including a camera and a microphone. Unless there are sub-networks formed and each sub-network receives the different types or "modalities"

of data as inputs, the only way that all these different types of data can be processed at the same time by a neuron is by inputting them to the neural network as a single vector. Also note that nowhere in the claims is there any recitation of inputting data to the network.

Examination Considerations

10. Examiner has cited particular columns and line numbers (or paragraphs) in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific imitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the Applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. The entire reference is considered to provide disclosure relating to the claimed invention.

11. The claims and only the claims form the metes and bounds of the invention. "Office personnel are to give the claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 105455, 44USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. In re Prater, 415 F.2d, 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, l 45-48; p 2100-9, c 1, l 1-4). The Examiner has full latitude to interpret each claim in the broadest reasonable sense.

Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

12. Examiner's Notes are provided with the cited references to prior art to assist the applicant to better understand the nature of the prior art, application of such prior art and, as appropriate, to further indicate other prior art that maybe applied in other office actions. Such comments are entirely consistent with the intent and spirit of compact prosecution. However, and unless otherwise stated, the Examiner's Notes are not prior art but a link to prior art that one of ordinary skill in the art would find inherently appropriate.

13. Unless otherwise annotated, Examiner's statements are to be interpreted in reference to that of one of ordinary skill in the art. Statements made in reference to the condition of the disclosure constitute, on the face of it, the basis and such would be obvious to one of ordinary skill in the art, establishing thereby an inherent prima facie statement.

14. Examiner's Opinion: items 11-13 apply. The claims and only the claims form the metes and bounds of the invention. The Examiner has full latitude to interpret each claim in the broadest reasonable sense.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Huang US Patent #7,069,257

Pao et al. US Patent #6,907,412

Hoya US PG PUB #2003/0115165

16. Claims 1-15 and 18-21 are rejected.

Correspondence Information

17. Any inquires concerning this communication or earlier communications from the examiner should be directed to Omar F. Fernández Rivas, who may be reached Monday through Friday, between 8:00 a.m. and 5:00 p.m. EST. or via telephone at (571) 272-2589 or email omar.fernandezrivas@uspto.gov.

If you need to send an Official facsimile transmission, please send it to (571) 273-2589.

If attempts to reach the examiner are unsuccessful the Examiner's Supervisor, David Vincent, may be reached at (571) 272-3080.

Hand-delivered responses should be delivered to the Receptionist @ (Customer Service Window Randolph Building 401 Dulany Street Alexandria, VA 22313), located on the first floor of the south side of the Randolph Building.

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/Omar F. Fernández Rivas/
Examiner, Art Unit 2129
Monday, April 14, 2008.

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Supervisory Patent Examiner, Art Unit 2129